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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|--------------------------|------------------|
| 10/829,104 | 04/21/2004 | John H. Rosenfeld | H1799-00219 | 6484 |
| 41396 7590 12/27/2006 DUANE MORRIS LLP IP DEPARTMENT 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103-4196 | | | EXAMINER DUONG, THO V | |
| | | | ART UNIT 3744 | PAPER NUMBER |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
| 3 MONTHS | | 12/27/2006 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/829,104

Applicant(s)

ROSENFELD ET AL.

Examiner

Tho v. Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-19,21-23,26,29,30,34-38,41 and 42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 and 30 is/are allowed.
- 6) ☒ Claim(s) 2,6,8-11,13-19,21-23,26,34-37,41,42 and 381 is/are rejected.
- 7) ☒ Claim(s) 7 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/2/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Receipt of applicant's amendment filed 9/21/06 is acknowledged. Claims 1-2,6-19,21-23,26,29-30,34-38 and 41-42 are pending.

Election/Restrictions

Applicant's election without traverse of species of figures 36-37 in the reply filed on 9/21/06 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-11,13-16,18 and 36-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 16, the limitation of "said metal particles that are constituent portion of said braze compound comprises a smaller size than said metal particles" renders the scope of the claim indefinite since it is not clear how "said metal particles" can be smaller than "said metal particles". Regarding claim 13, the limitation of "said brazing compound is present in the range from about two percent to about ten percent" renders the scope of the claim indefinite since it is not clear whether applicant is claiming the weight percent over the wick structure or the volume percent over the wick structure or any other percentage of the brazing constituents over the heat pipe.

Regarding claim 15, the limitation of "said braze compound particles comprise about minus three hundred and twenty five-mesh" renders the scope of the claim indefinite since it is not clear if applicant is claiming the capillary structure, and the heat pipe as a final product or as

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an intermediate product, since as the final product, the brazing compound is no longer in particle shape but fillets and vice versa, as the intermediate product, the brazing compound is in particle shape but no fillets.

Claims 9-11,14,16,18 and 36-37 recites the limitation "said metal particles" in lines 1-2.

There is insufficient antecedent basis for this limitation in the claim.

The examiner has not able to determine whether claims 9-11,13-16 and 36-37 are new or inventive in view of the clarity issues above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19,21,26 are rejected under 35 U.S.C. 102(b) as being anticipated by Fries (US 4,108,239). Fries discloses (figures 1,3 and column 4, lines 25-30) a heat pipe comprising a sealed tubular enclosure (2) having an interior surface; a working fluid disposed within the enclosure; and a wicking structure (1) including a first species of particle (9) and a second species of particle (8); the plurality of particles being joined together so as to form a network of capillary passageways between the particles; the first species of particle and the second particle are each disposed within the wicking structure in substantially homogenous layers; fins (5) projecting radially outwardly from an outer surface of the tubular enclosure; each end of the heat pipe sealingly fixed to a base (end plate), wherein the wick (1) is disposed on.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fries in view of Corman et al. (US 3,828,849). Fries substantially discloses all of applicant's claimed invention as discussed above except for the limitation that at least one vapor vent is defined through the wick. Corman discloses (figure 1) a heat pipe that has at least one vapor vent (28) is defined through the wick for a purpose of providing a low impedance path to the passage of vapor there through. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Corman's teaching in Fries's heat pipe for a purpose of providing a low impedance path to the passage of vapor there through.

Claims 1-2,6,8,17,22-23 and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries and/or Corman in view of Yoshizumi et al. (JP 359024538A). Fries and Corman substantially disclose all of applicant's claimed invention as discussed above except for the limitation that the plurality of particles are joined by a brazing material compound such that fillets of the brazing compound are formed between adjacent ones of the plurality of particles. Yoshizumi discloses (figures 1-4) a heat pipe comprising a wick (2,4) disclosed on at least one of the internal surfaces and comprising a plurality of copper particles (2) joined together by a silver alloy brazing compound such that fillets (4) of the brazing compound are formed between adjacent ones of the plurality of copper particles so as to form a network of capillary

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passageways between the particles for a purpose of forming a highly efficiency heat pipe. The spherical copper powder (2) inherently has a melting point as claimed and the silver has a melting point lower than the melting point of copper. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Yoshizumi's teaching in the Fries's heat pipe for a purpose of forming a highly efficiency heat pipe.

Allowable Subject Matter

Claims 7 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 29-30,35 and 38 are allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sehmbey et al. (US 6,460,612) discloses a heat transfer device with self adjusting wick.

Ogushi et al. (US 6,330,907) discloses an evaporator and loop type heat pipe using the same.

Henne et al. (US 6,303,191) discloses a process for the production of a heat pipe.

Oh et al. (US 2003/0141045A1) discloses a heat pipe and method of manufacturing the same.

Koichiro (JP 2002022379A) discloses a heat pipe with excellent in heat dissipation performance.

Koichi et al. (JP 2000055577A) discloses a manufacturing method of heat pipe.

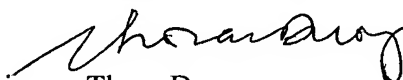
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tho v. Duong whose telephone number is 571-272-4793. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tyler J. Cheryl can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TD

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December 18, 2006



Tho v Duong
Primary Examiner
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